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EXAMINER	
BROOME, SAID A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER-PIKE J. SLOAN and JOHN M. SNYDER

Appeal 2010-001038
Application 10/692,361
Technology Center 2600

Before MAHSHID D. SAADAT, MARC S. HOFF, and
CARLA M. KRIVAK, *Administrative Patent Judges.*

KRIVAK, *Administrative Patent Judge.*

DECISION ON APPEAL[1]

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-20. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

STATEMENT OF THE CASE

Appellants' claimed invention is a computer graphics system and method for rendering images of an object on a computer including a graphics processing unit (Spec. 3:14-17)

Claim 1, reproduced below, is representative of the subject matter on appeal.

1. A method of producing radiance transfer coefficients for a set of points sampled over a modeled object for rendering images of the object on a computer having a graphics processing unit for performing operations over sets of data values contained in textures, the method comprising:

creating an object positions texture containing a set of data values representing positions of a set of points sampled over the object mapped into a texture space;

creating an object normals texture containing a set of data values representing normals of the set of sampled points mapped into the texture space;

iteratively, for each of a set of directions sampled about the object,

rendering the object from the direction to produce a shadow buffer representing depth from the object in the direction for the set of points;

as a texture-based operation using the graphics processing unit, determining cosine terms of the set of sampled points for the currently iterated direction based on the normals represented in the object normals texture and currently iterated direction;

as a texture-based operation using the graphics processing unit, determining shadowing of the set of sampled points for the currently iterated direction based on the depths

represented in the shadow buffer and positions represented in the object positions texture;

as a texture-based operation using the graphics processing unit, determining radiance transfer contribution of the set of sampled points for the currently iterated direction based on the determined cosine terms and shadowing; and

accumulating the radiance transfer contributions of the set of sampled points for the currently iterated direction with that of previously iterated directions;

producing a radiance transfer value for each of the sampled points from the accumulated radiance transfer contributions for the iterated directions at the respective sampled points;

rendering an image of the object in a lighting environment based on the accumulated radiance transfer contributions; and

presenting the image.

ANALYSIS

The Examiner rejected claims 1-20 under 35 U.S.C. § 103(a) based upon the teachings of various combinations of Sloan (*Precomputed Radiance Transfer for Real-Time Rendering in Dynamic, Low-Frequency Lighting Environments,* 2002, pp. 527-536), Burke (US 2003/0063096 A1), Purcell (*Ray Tracing on Programmable Graphics Hardware*, July 2002, pp. 703-712), Arvo (*Monte Carlo Ray Tracing*, July 29, 2009, pp. 1-5, 13-42), Morioka (US 6,333,742 B1), and Airey (US 6,650,327 B1)

The Examiner finds Sloan discloses "iteratively calculating the radiance for each point for a plurality of directions" (Ans. 6, 23). The Examiner then uses Purcell's nesting loops for modifying Sloan, thus reversing the inner and outer loops of a radiance transfer method and

optimizing the speed and efficiency of radiance processing by iteratively calculating the radiance for each direction for each point (Ans. 6, 23, 24).

Appellants contend reversing the loops in Sloan as taught by Purcell would not result in Appellants' invention (Br. 11-12). We agree with Appellants' assertions that reversing Sloan's loops would not achieve the limitations in Appellants' claims. Claim 1, along with claims 2 and 3, includes "producing radiance transfer coefficients for a *set of points* sampled" and then "producing a radiance transfer value for *each of the sampled points* from the accumulated radiance transfer contributions for the *iterated directions* at the respective sampled points" (emphasis added) (Br. 12). In contrast, if Sloan's loops are reversed, Sloan would produce a "radiance transfer for *each direction* that integrates contributions over *all sampled points*" of an object's surface (emphasis added) (Br. 12). As Appellants assert, the resulting quantities are not the same: Appellants' claim produces a radiance transfer value per point; Sloan, as modified, produces a radiance transfer per direction. Thus, we agree that modifying Sloan by reversing the values in the outer and inner loops does not produce a "radiance transfer at each point for the iterated directions" as claimed in independent claims 1-3 and claims 4-20, which depend therefrom (Br. 12).

CONCLUSION

The Examiner erred in rejecting claims 1-20 under 35 U.S.C. § 103.

DECISION

The Examiner's decision rejecting claims 1-20 is reversed.

REVERSED

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